

PATENT
W&B Ref. No. : INF 2127-US
Atty. Dkt. No. INFN/WB0053

IN THE CLAIMS:

Please cancel claims 1-6 and 14-22 without prejudice and amend the claims as follows:

1. (Canceled) An integrated test circuit in an integrated circuit for testing a plurality of internal voltages of the integrated circuit, comprising:
 - a switching device configured to select one of the internal voltages in accordance with a selection signal for the purpose of testing;
 - a reference voltage terminal for inputting a reference voltage from an external device; and
 - a comparator device configured to compare a measurement voltage, corresponding to the selected internal voltage, with the externally provided reference voltage and in order to output an error signal as a result of the comparison.
2. (Canceled) The test circuit of claim 1, wherein the corresponding measurement voltage equals the selected internal voltage and the reference voltage provided by the external device is different for each selected internal voltage.
3. (Canceled) The test circuit of claim 1, further comprising a voltage divider for at least one internal voltage to be tested, in order to generate the measurement voltage as a predetermined fraction of the internal voltage to be tested.
4. (Canceled) The test circuit of claim 1, further comprising a voltage divider for each of the internal voltages, the voltage dividers being configured so that the measurement voltage corresponding to the respective internal voltage has the same potential at each voltage divider.
5. (Canceled) The test circuit of claim 4, wherein the reference voltage used to test each internal voltage is the same for each internal voltage.

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6. (Canceled) The test circuit of claim 1, further comprising a control circuit configured to selectively connect each one of the plurality of voltage dividers to the comparator device.

7. (Currently Amended) ~~An integrated test circuit in an integrated circuit for testing a plurality of internal voltages of the integrated circuit, comprising:~~

an integrated test circuit in the integrated circuit for testing a plurality of internal voltages of the integrated circuit, the integrated test circuit comprising:

a switching device configured to select one of the internal voltages in accordance with a selection signal;

a comparator device configured to compare a measurement voltage, corresponding to the selected internal voltage, with an externally provided reference voltage and ~~in order~~ to output an error signal as a result of the comparison; and

a storage element in communication with the comparator device to store data corresponding to the error signal.

8. (Currently Amended) The ~~test~~ integrated circuit of claim 7, wherein the switching device is a multiplexer.

9. (Currently Amended) The ~~test~~ integrated circuit of claim 7, further comprising a voltage divider for each of the internal voltages, the voltage dividers being configured so that the measurement voltage corresponding to the respective internal voltage has the same potential at each voltage divider.

10. (Currently Amended) The ~~test~~ integrated circuit of claim 7, further comprising a signal terminal and a second switching element operable to selectively connect the signal terminal to the storage element, whereby the error signal may be read out by an external device connected to the signal terminal.

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11. (Currently Amended) The ~~test~~ integrated circuit of claim 10, wherein the second switching element is further operable to selectively connect the comparator device to the signal terminal to apply the reference voltage to the comparator device.

12. (Currently Amended) The ~~test~~ integrated circuit of claim 11, wherein the second switching element is further operable to selectively connect the signal terminal to an internal input/output signal line of the integrated circuit.

13. (Currently Amended) The ~~test~~ integrated circuit circuit of claim 12, further comprising a control circuit configured to issue test control signals to the switching device and the switching element.

14. (Canceled) A method for testing an integrated circuit using an on-board test circuit integrated with integrated circuit, comprising:

(a) selecting an internal voltage of a plurality of internal voltages of the Integrated circuit;

(b) receiving a reference voltage from an external source connected to a signal terminal of the on-board test circuit;

(c) comparing a measurement voltage corresponding to the selected internal voltage with the reference voltage;

(d) outputting an error signal as the result of the comparison; and

(e) repeating (a) – (d) for each of the plurality of internal voltages.

15. (Canceled) The method of claim 14, further comprising dividing the selected internal voltage to generate the measurement voltage as a predetermined fraction of the selected internal voltage.

16. (Canceled) The method of claim 14, wherein the dividing is done by a plurality of dividers, one divider corresponding to each internal voltage; and wherein the voltage dividers are configured so that the respective measurement voltage has the same potential at each voltage divider.

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17. (Canceled) The method of claim 14, wherein the comparing is done by a comparator device.

18. (Canceled) The method of claim 14, further comprising storing the error signal in a storage element.

19. (Canceled) The method of claim 18, further comprising selectively connecting the signal terminal to the storage element, whereby the error signal may be read out by an external reading device.

20. (Canceled) The method of claim 18, further comprising alternatively connecting the signal terminal to the storage element and a comparator device which receives the reference voltage as input.

21. (Canceled) The method of claim 18, further comprising:
during a test mode, alternatively connecting the signal terminal to the storage element and a comparator device which receives the reference voltage as input; and
during an operation mode, connecting the signal terminal to an internal input/output signal line of the integrated circuit.

22. (Canceled) The method of claim 18, further comprising issuing control signals from a control circuit of the on-board test circuit to a selector device responsive to the control signals to selectively connect the signal terminal to one of:
the storage element;
a comparator device which receives the reference voltage as input; and
an internal input/output signal line of the integrated circuit.

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Please add the following new claims:

23. (New) An integrated circuit, comprising:
a test circuit for testing a plurality of internal voltages utilized in the integrated circuit, the test circuit comprising:
a first switching device having a selection signal input for receiving a selection signal, the switching device configured to selectively connect to one of the plurality of internal voltages in accordance with the received selection signal;
a comparator device configured to compare a measurement voltage, corresponding to the selected internal voltage, with an externally provided reference voltage and to output an error signal based on the comparison; and
a storage element connected to receive an output of the comparator device and store data corresponding to the error signal.
24. (New) The integrated circuit of claim 23, wherein the test circuit further comprises:
a control unit configured to provide the selection signal to the switching device.
25. (New) The integrated circuit of claim 24, further comprising:
a signal terminal configured to provide an external reference voltage to the comparator.
26. (New) The integrated circuit of claim 25, wherein the test circuit further comprises:
a second switch connected to the signal terminal, wherein the second switch is configured to selectively connect the signal terminal to one of the comparator device, an output of the storage element, and an internal signal line of the integrated circuit which is utilized during normal operation of the integrated circuit.

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27. (New) The integrated circuit of claim 26, wherein the control unit is further configured to control the second switch.

28. (New) The integrated circuit of claim 27, wherein the signal terminal is utilized to read out the data stored in the storage element when the second switch is set to connect the signal terminal to the output of the storage element.

29. (New) The integrated circuit of claim 28, wherein the storage element comprises a latch having two oppositely coupled inverters.

30. (New) The integrated circuit of claim 24, wherein the first switching device is a multiplexer.

31. (New) The integrated circuit of claim 23, wherein the test circuit further comprises:

a voltage divider for each of the internal voltages, each voltage divider configured to provide the respective measurement voltage corresponding to the respective internal voltage.

32. (New) The integrated circuit of claim 23, wherein the voltage dividers provide substantially similar voltage levels.

33. (New) A method for operating an integrated circuit, comprising:
providing a test circuit in the integrated circuit for testing a plurality of internal voltages utilized in the integrated circuit, the test circuit comprising:

a first switching device having a selection signal input for receiving a selection signal, the switching device configured to selectively connect to one of the plurality of internal voltages in accordance with the received selection signal;

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a comparator device configured to compare a measurement voltage, corresponding to the selected internal voltage, with an externally provided reference voltage and to output an error signal based on the comparison; and

a storage element connected to receive an output of the comparator device and store data corresponding to the error signal;

providing the selection signal to the first switching device to select one of the internal voltages;

receiving the reference voltage from an external source connected to the test circuit;

comparing a measurement voltage corresponding to the selected internal voltage with the reference voltage; and

storing data corresponding to the error signal in the storage element.

34. (New) The method of claim 33, further comprising:

providing, in the test circuit, a second switch connected to a signal terminal of the integrated circuit, wherein the second switch is configured to selectively connect the signal terminal to one of the comparator device, an output of the storage element, and an internal signal line of the integrated circuit which is utilized during normal operation of the integrated circuit; and

selectively connecting the signal terminal to the output of the storage device, via the second switching device; and

reading out the error signal stored in the storage element.

35. (New) The method of claim 33, further comprising:

after completing the testing of the internal voltages, setting the second switch to connect the signal terminal to the internal signal line of the integrated circuit which is utilized during normal operation of the integrated circuit.